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ABSTRACT

Sociological research on teacher decision making in curriculum and instructional development is reviewed. The Institute for Research on Teaching (IRT) shares a number of concerns with this research, including the question of who determines content, the extent to which content covered covaries with social class and sex, and teachers' conceptions of content. The Content Determinants research project considered the influence of parents, peers, principals, tests, textbooks, and established objectives in teacher decision making. Other studies included explore the influence of compatibility, costs, obligation, urban and rural school districts, centralized and decentralized programs, teacher isolation, and teacher change in assignment as possible factors in teacher decisions. Implications for further research are made. (Author/CJ)

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Research Series No. 62

FACTORS INFLUENCING TEACHERS' DECISIONS ABOUT WHAT TO TEACH: SOCIOLOGICAL PERSPECTIVES

John Schwille, Andrew Porter, Michael Gant,
Gabriella Belli, Robert Floden,
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and William Schmidt

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AUG 1 8 1980

Institute for Research on Teaching

Teachers' thoughts and decisions are the focus of studies currently under way at Michigan State University's Institute for Research on Teaching (IRT). The IRT was founded in April 1976 with a $3.6 million grant from the National Institute of Education. That grant has since been renewed, extending IRT's work through September 1981. Funding is also received from other agencies and foundations. The Institute has major projects investigating teacher decision-making, including studies of reading diagnosis and remediation, classroom management strategies, instruction in the areas of language arts, reading, and mathematics, teacher education, teacher planning, effects of external pressures on teachers' decisions, socio-cultural factors, and teachers' perceptions of student affect. Researchers from many different disciplines cooperate in IRT research. In addition, public school teachers work at IRT as half-time collaborators in research, helping to design and plan studies, collect data, and analyze results. The Institute publishes research reports, conference proceedings, occasional papers, and a free quarterly newsletter for practitioners. For more information or to be placed on the IRT mailing list please write to : The IRT Editor, 252 Erickson, MSU, East Lansing, Michigan 48824.

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Abstract

Historically, the cognitive content of instruction has been of little interest to sociologists. Over the last decade, however, this lack of interest has been severely criticized by the "new" sociologists of education in Britain. The IRT's Content Determinants research shares a number of concerns with the "new" sociology of education, including the question of who determines content, the extent to which content covered covaries with social class and sex, and teachers' conceptions of content. The IRT research on content also differs in some fundamental ways from the "new" sociology, including differences in epistemological and methodological views. The authors point out and discuss these similarities and differences. The research approach of the Content Determinants group is illustrated with a discussion of factors that might affect teachers' choice of what to teach. That discussion is based on questions of compatibility, obligation, and benefits-costs. The authors also discuss their plans for studies that are particularly relevant to the issues raised in this paper.

FACTORS INFLUENCING TEACHERS' DECISIONS ABOUT WHAT TO TEACH: SOCIOLOGICAL PERSPECTIVES[1]

John Schwille, Andrew Porter, Michael Gant, Gabriella Belli, Robert Floden, Donald Freeman, Lucy Knappen, Therese Kuhs, and William Schmidt[2]

Historically, the cognitive content of instruction has been of little interest to sociologists. Over the last decade this lack of interest has been severely criticized by the "new" sociologists of education in Britain. We share their conviction that the content of instruction should not be taken for granted, but should be the subject of careful investigation. We want to know what determines variation in content taught and in perceptions of what is taught. However, we do not follow the new sociologists in their contention that the methods of quantitative social science, as currently practiced, are unsuitable for this enterprise.

Our research program--the Content Determinants Project--is a multidisciplinary investigation of factors influencing the content of instruction in elementary school mathematics. While not originally conceived in response to the sociology of education literature, it does speak to research in this field.

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[1]This paper was presented at the annual meeting of the American Sociological Association, Boston, 1979.

[2]John Schwille is a senior researcher with IRT's Content Determinants Project. Andrew Porter is coordinator of that project. Gabriella Belli and Therese Kuhs are research interns with the project; Michael Gant, an instructor at Texas A & M University, is a former IRT research intern. Lucy Knappen is a teacher collaborator working on the project. Robert Floden, Donald Freeman, and William Schmidt are senior researchers with the Content Determinants Project.

Sociology and the Importance of Content

Content and the Sociology of Education in Retrospect

Efforts to understand the school as a social institution, both in its inner workings and external ramifications, have given sociologists a comprehensive outlook on education. Almost any aspect of schooling can be viewed from a social perspective. The document Teaching Sociology of Education, published in 1978 by the Sociology of Education Section of the American Sociological Association, shows that sociology of education courses cover topics as broad and diverse as schools and socialization, the classroom as a social system, education and stratification, selection and certification, the school and the family, race and education, and status attainment and education (Persell, Hammack, & Thielens, 1978). Within these courses the major paradigms of sociology are represented--from structural functionalism and conflict theory to symbolic interactionism and phenomenological sociology. Yet, in spite of this breadth and diversity of interests, the cognitive content of instruction, which is of such importance to educational psychology, does not appear to be of major concern to the sociologists whose work is reported in this volume.

The sociologists who have studied schooling have tended not to see cognitive instruction problems as the most critical problems of schooling. For example, in Bidwell's 1965 discussion of the school as an organization, the problems of primary interest were those of motivating and satisfying a conscripted clientele and of professional discretion versus hierarchical control. Spady and Mitchell (Note 1) cite 10 works, including the works of such well-known

sociologists as Becker, Parsons, Stinchcombe, and Waller, in support of the contention that the "control of students [is] at the center of school system concerns."

When sociological writings turn to the educative functions of schooling, they typically give socialization equal or more attention than cognitive instruction. This preoccupation with socialization can be seen in the classics of sociology, such as those of Durkheim, as well as in the work of such contemporaries as Dreeben (1968).

Certain exceptions might be noted. Gracey's 1972 case study of a suburban school gives content a central role, arguing that a certain content is the result of an overly bureaucratic organization. In general, when content has been taken into account, gross distinctions about the nature of content have sufficed rather than the fine distinctions which we use in our research. For example, in the 1978 article by Alexander, Cook, and McDill, a school process model is used "to determine the differential antecedents and consequences of high school curriculum placement." Curriculum placement is defined dichotomously as academic versus other.[3]

The "New" Sociology of Education As It Relates To Our Research

In reaction to sociologists who have shown so little interest in the content of instruction, a self-proclaimed "new sociology of education" has emerged over the last decade in England.[4] Its proponents have been critical of earlier work in the sociology of education, which they see as too much concerned with the organization and processing of people and too little concerned with the extent to which the content of education influences and is influenced by social processes. The following statement from Eggleston (1977) is illustrative of the alternative

[3] A very similar model has been reported for French data by Hout and Garnier (1979).

[4] Reviews of this development can be found in Hurn (1976), Karabel and Halsey (1977), and Bernbaum (1977).

offered by the new sociologists: "The curriculum is . . . viewed as a central factor in the establishment and maintenance of the power and authority structures both of society and the school" (p. 6).

Eggleston goes on to suggest five points with which a sociological analysis of content decision making ought to be concerned:

1. The definition of what shall be regarded as knowledge, understanding, values, and skills;
2. The evaluation of this knowledge into areas of greater or lesser importance and status;
3. The principles on which such knowledge shall be distributed (to whom and at what time various kinds of knowledge shall be made available and from whom they shall be withheld);
4. The identity of the groups whose definitions prevail in these matters.
5. The legitimacy of these groups to act in these ways. (p. 23)

We will take these points and consider how they might be transformed to fit our research on elementary school mathematics.

Definition of knowledge. The definition of what shall be regarded as knowledge, understanding, values, and skills in elementary school mathematics has been a central task for our research, which started with a content analysis of the mathematics in four standardized tests commonly used in American elementary schools (Porter, Schmidt, Floden, & Freeman, 1978). A taxonomy for fourth-grade mathematics was developed as a part of this work (Kuhs, Schmidt, Porter, Floden, Freeman, & Schwille, Note 2). Subsequently, the content of mathematics textbooks was also analyzed (Porter, Kuhs, Freeman, Floden, Knappen, Schmidt, & Schwille, Note 3). Then in the spring, 1979, we conducted 20 in-depth interviews (from about two to four hours in duration) with teachers in a local school district. The main purpose of the interview was to obtain as complete a statement about the content of elementary school mathematics

as possible. Of particular interest were (1) the level of detail with which content was described, (2) references to content that did not fit the taxonomy which had been developed for tests and textbooks, (3) the meaning given to certain key terms, and (4) perceived relationships among topics. Little analysis has been done so far, but we believe that considerable variation will be found in the content described by teachers within a single school district during the course of these interviews.

In general, we find there is no one answer to the question, "What is elementary school mathematics?" The answers to this question vary from person to person in ways that we expect to be meaningfully related to social position and background. Certainly, the elementary school mathematics of the expert mathematician is not necessarily the elementary school mathematics of the fourth-grade teacher and the mathematics of the teacher is not, in many cases, the mathematics of the student or parent.

At times the differences may be dramatic. According to Easley (Note 4), the traditional mathematics teacher sees mathematics as a vehicle for socialization: "Drill may be linked with the orderly society and advancement of our country" (See also Note 5). In a more prosaic example, one of the teachers we interviewed, even though involved in the implementation of a sophisticated mathematics curriculum, had the following to say about neatness:

> That sounds sort of ridiculous. But it seems . . . if you don't catch kids about this time with some skills on how to set up a paper or how to do these things, that it gets harder for them as they go along. It's kind of like bad habits. It's hard to break writing either little tiny numbers that they can hardly read, or [writing] so carelessly. And yet . . . very successful people. . . I'm sure do very messy work. So maybe it isn't as important as it seems to me, but I include that as part of my mathematics curriculum.

Differences also appear at a more fine-grained level. For example, in a group interview we found that for some teachers, the study of different number bases is seen as an opportunity to develop conceptual understanding of place value; for others, this topic is used for drill and practice. Given such differences, the teacher can take the same learning activities and explain them in diverse ways to appeal to different constituencies. For example, a mathematical game may be justified to mathematicians in terms of developing mathematical concepts, to parents in terms of computational skills, and to students in terms of fun.[5]

Thus to some extent we agree with the new sociologists in their insistance on the relative rather than the absolute nature of content. Eggleston (1977) contrasts this relativist position with the following view of content, which he attributes to various philosophers and psychologists:

> There are established and knowable structures of knowledge that exist independently of teachers or indeed of any other individuals; . . . these patterns may be discovered, clarified and comprehended, and . . . adherence to them is either necessary or at least highly desirable if curriculum is to be meaningful and learning experiences successful. (p. 61)

In Eggleston's opinion, this view fails to take sufficient account of the social influences and social biases in prevailing definitions of content. In this respect, the new sociology of education applies to schools the relativist perspective of the sociology of knowledge, which under the influence of Marx and Mannheim has criticized many kinds of knowledge, once thought unbiased, for being the servants in disguise of dominant social groups (see Apple (1979) for a discussion of the dangers of

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[5] Lortie (1969) suggests that teachers are free to select from classroom activities that which they take as evidence of learning, while Weick (1976) asserts as an attribute of loose coupling that "it should always be possible to justify the action as fitting the intentions of those who complain."

excessive relativism in this context).

Evaluation of the status of knowledge. In our interviews with teachers, we have seen that the importance attributed to various aspects of mathematics varies considerably. One example is the relative importance of conceptual understanding and applications (e.g., story problems) as opposed to computational skills. Some teachers follow the folklore of everyday mathematics, with its emphasis on computation and daily use, while others are closer to university mathematics, in which arithmetic is seen to illustrate certain properties of mathematical systems.

Distribution of knowledge. Our research is in large part a systematic investigation of the distribution of mathematics knowledge in elementary school. The dependent variable with which we are most concerned is the content delivered to individual children in the classroom. Our independent variables are the external factors that determine variation in content delivered. For example, we are interested in the influence of textbooks and tests as instruments of control in the delivery of content. We would like to assess the effect of accountability systems that establish instructional objectives in mathematics and monitor the performance of students on these objectives.

Beyond these issues, there are other questions of interest to sociology -- questions that could become part of our research program. For example, the importance of advanced mathematics in various high status occupations raises the issue of differential access to those aspects of elementary mathematics that best prepare students for more advanced courses. One might begin to look at this issue by comparing the content

of elementary school mathematics in school systems preparing many students for college with the content in systems which send few students to higher education.

There may also be important distributional differences associated with the sex of students if teachers and others consider certain types of content more important for boys than girls or vice versa. We would like to know whether and when differences in content covered in mathematics begin to show up between boys and girls in the same classroom.

A possible clue to such differences might be provided by an analysis of teachers' concepts of readiness. In educational terminology, the word "readiness" is usually understood as referring to a level of cognitive or emotional maturity. We want to know whether teachers also take into account family background and sex characteristics when they decide whether particular children are "ready" for particular items of mathematics content.

Groups whose definitions prevail. Our questions about social background and content provide a link to the new sociologists of education who--to use our terminology--have been concerned mainly with content covered as one of the mediating variables through which an existing state of social stratification is reproduced within new generations of students. In this respect, these new sociologists follow the French sociologist Pierre Bourdieu (Bourdieu & Passeron, 1977), who sees schools as helping privileged families pass on their cultural capital and as legitimating this form of inheritance under the guise of meritocracy. This point of view has been applied to mathematics by Eggleston (1977):

> If social differentiation is to take place children must be able to see it as "legitimate." The experience of mathematics could be very appropriate for this purpose. Pupils have the chance to see that there is a high-status group of those who can "do" mathematics and another, often larger,

> group of lower-status people who, though they appear to have had the chance to join the high-status group, have failed to make it. Differentiation in such circumstances appears to be not only fair but also objective. . . . The differentiation is of course a social selection process controlling opportunities for adult status and life chance. Commonly it is also a socially reinforcing one in which children from "superior" social backgrounds legitimate their superior prospects. (p. 80f)

Alexander et al. (1978) use path analysis to address the question of the relation between curriculum and stratification in a more limited context with more equivocal results. They find that being in different curricula does affect the achievement of students independently of other variables. Being in academic tracks improves the performance of students and being in other tracks depresses performance (other factors having been taken into account). However, in their data, socioeconomic status has no *direct* effect on track placement. In fact, over 60% of the variance in track placement is unexplained in spite of the use of various prior measures of SES, ability, and plans. Alexander and his colleagues conclude that "differential tracking in secondary schools thus introduces academic inequalities where none previously existed, and in so doing contributes independently to educational and socioeconomic inequalities" (p. 65).

Our own approach to the question of whose definitions prevail is an empirical and pluralistic one, which does not presume that mathematics always operates in the same way to reinforce stratification. Variation in conceptions of mathematics and their implications for stratification is a matter for empirical investigation. We therefore intend to consider how the views of teachers on the importance of mathematics topics for particular students are influenced by parents, administrators, and others with whom teachers come in contact. We should find that the view

of mathematics as a path towards prestigious occupations is most likely to be held and passed on by those parents whose status provides access to information on what such occupations entail, but we are not sure whether to expect teachers to reinforce or counteract this bias.

The legitimacy of the prevailing groups. Legitimacy implies a shared belief that certain actions and outcomes are proper. The use of this term among the new sociologists is illustrated by Apple (1979) when he says,

> Technical knowledge will then be used as an intricate filter to stratify students according to their "ability" to contribute to its production. This, thereby, increases the sense of the neutrality of this process of economic and cultural stratification and both covers and makes more legitimate the actual workings of power and ideology in an unequal society. (p. 153)

In our research we are concerned not so much with the question of how supposedly objective knowledge serves to conceal power relationships as with the more general question of how certain conceptions of knowledge come to be judged valid. We want to know how particular groups of people justify what they consider competency in elementary school mathematics. What is the competency required of students and why? Of teachers? It is paradoxical indeed that a high status subject such as mathematics has been treated with such nonchalance in elementary school. What conditions explain the limited expectations that many schools have had for teachers and students?

In summary, the new sociology of education shares with our research:

1. A concern for the importance of the content of instruction and its differential distribution among schools and students;
2. Recognition that, in interpreting the distribution of content, one can consider content relative in the sense that definitions of content vary between and within categories of persons;
3. Interest in the question of who determines the content that is delivered in schools;

4. Interest in the extent to which content covered covaries with social characteristics such as social class and sex;

5. Interest in analyzing how teachers' conceptions of content may restrict the content delivered to children.[6]

Notwithstanding these similarities, our research differs in fundamental ways from what the new sociologists advocate. First, we do not share their commitment to what Karabel and Halsey (1977) call the "interpretive paradigm"[7] as a preferred epistemological and methodological approach, even though we see the importance of such distinctions as the difference between an actor's interpretation of his act and an observer's interpretation (Dale, 1974). Second, although we think it important to understand how people define knowledge in a given area, we see this sort of analysis not so much as an end in itself, but as a starting point for further investigation of how schools are organized and how they operate. We therefore see earlier work on the organization of schools as relevant to the problem of content. Third, unlike the new sociologists, we provisionally accept the validity of the terms educators use (e.g., content) and the problems they report (e.g., accountability) while remaining open to the possibility of reinterpretation. Finally, we are willing to study many aspects of content variation which bear little relationship to social stratification.

Sociology and Decisions About Content

In the literature that views schools as loosely coupled organizations, teachers are portrayed as enjoying considerable autonomy (Bidwell, 1965;

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[6]Hurn (1976) gives credit to the new sociologists for the notion that "every curriculum . . . contains a set of implicit theories about how children learn, what children of a given age can and cannot do, and how one can assess whether a child has 'learned' or not."

[7]The interpretive paradigm is an approach favored by researchers who are primarily influenced by phenomenological sociology and ethnomethodology.

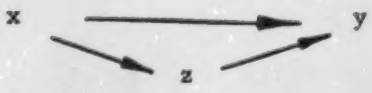
Lortie, 1969; Weick, 1976; March, 1978). From this point of view, "the learning activities of children and the teaching activities of teachers are marginally related to the activities of administrators" (March, 1978). Other studies of teaching and reports on new curricula make similar claims for teacher independence (Brown & McIntyre, 1978; Harding, 1978; Lortie, 1975; Taylor, 1975; Taylor & Reid, 1971).

This literature alerts us to the dangers in expecting hierarchical models of organization to account for the activities of teachers. Nevertheless, such models are used in much that is written about education. They are embodied in the accountability movement and the belief of its followers that through good management teachers will follow the directives of school boards and superintendents.

The contrast between professionals exercising independent judgment and professionals following the directives of the organizations within which they work is a classic sociological theme in teaching as well as other occupations (e.g., Dreeben, 1970). The danger in this contrast is that for lack of a middle position (i.e., a view of teachers which simultaneously takes both extremes into account), teacher autonomy or teacher subordination can easily be overestimated.

In the paper we wrote on content decision making and the politics of education (Schwille, Porter, & Gant, Note 6), we pointed out that viewing the teacher as a policy maker or political broker is one way to reconcile the two polar positions. From this point of view, teachers enjoy enough discretion to be influenced by their own conceptions of what schooling ought to be. But at the same time teachers will choose (or be constrained to choose) to follow certain outside pressures. These pressures may be either consistent or inconsistent with what they want schooling to be.

This point of view is illustrated by our model of content decision making at its simplest:



where x represents various external factors that might influence the content of instruction; z, the teacher's conceptions of what ought to be covered in elementary school mathematics; and y, the content actually covered in the classroom. Two questions posed by this model are:

1. To what extent is the content of classroom instruction determined by factors external to the teacher?

2. To the extent that content is not determined by external factors, how are decisions made and what is the role of the teacher?

Our first small step toward answering those questions is described below.

Policy-Capturing Study[8]

This study investigated teacher perceptions of the effects of six sources of pressure to change the content of fourth-grade mathematics (Floden, Porter, Schmidt, Freeman, & Schwille, Note 7). Our approach, following other research on human judgment (e.g., Slovic & Lichtenstein, 1973), used written descriptions of hypothetical schools. The factors considered in these descriptions included

[8]The word "policy" here refers to a mathematical model representing the weights given cues in the judgments of an individudal. Regression equations are frequently used for this purpose. This psychological use of the term "policy" thus differs from references to educational "policy" in a political science sense.

pressures from parents, teachers, and the school principal as well as district instructional objectives, textbooks supplied to the teacher, and test results reported to the local newspaper. By systematically varying the presence or absence of these factors, 63 vignettes were created. In each case, the pressure advocated the addition of five new topics and provided no support for the teaching of five topics that the teacher ordinarily covered. The pressures were always consistent in that the topics supported by each source were identical. This consistency can be seen in the following example of a vignette for objectives, test, and teachers:

> In Wakita the central administration has published, for fourth-grade mathematics, a set of objectives which all teachers have been directed to follow. At the end of the year, a standardized test in mathematics is administered in each grade. The test results for each school are published, by grade level, in the local newspaper.
>
> Shortly after your arrival, you study the set of objectives and the test which is used. You realize that these materials do not deal with five topics you have been accustomed to teaching in fourth grade. You also note that they do include material on five topics you have never taught to fourth graders.
>
> Also imagine that the teachers in your school express a particular interest in mathematics at staff meetings and in conversations in the teachers' room. During these discussions you find that the fifth and sixth grade teachers feel you should teach five topics you have not taught to fourth graders in the past. They also question the value for fourth graders of five topics you have been used to teaching. The topics mentioned in each case are the same as those you noted in your examination of the test and the objectives.

After reading the vignette, teachers were asked once in terms of core topics and once in terms of peripheral topics, whether they would teach the five new topics and whether they would continue to teach the five old topics.

Seventy-five teachers were recruited for the study from five

Michigan cities and surrounding areas.[9] The most notable aspect of their response to the vignettes was an expressed willingness to change instructional content, whatever the pressure for change. Differences between pressures in degree of expressed acquiescence were generally slight. The pressure most endorsed by the teachers was district objectives. For example, regarding the core topic question about whether the teacher would add five topics usually covered in other school systems, the mean response for vignettes with each of the following pressures standing alone was as follows:

	Mean Response[10]	Standard Error
Objectives	1.67	(0.19)
Tests	2.06	(0.24)
Textbooks	2.47	(0.29)
Principal	2.49	(0.25)
Other Teachers	2.52	(0.24)
Parents	2.73	(0.24)

Taking the same question and looking at the means for all the vignettes with one source of pressure, two sources, and so on, we see that as the number of pressures increased, the teachers' expressed willingness to change approached virtual certainty.

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[9] Within location teachers were randomly assigned to a half replicate of the 2^6 design. To control for order effects, each teacher received a different random ordering of the appropriate vignettes.

[10] A response of 1 is "virtually certain to teach these topics," 2 "fairly certain to teach these topics," and 3 "more inclined to teach these topics than not."

	Mean Response[10]	Standard Error
One-pressure vignettes	2.35	(0.19)
Two-pressure vignettes	1.76	(0.11)
Three-pressure vignettes	1.59	(0.11)
Four-pressure vignettes	1.39	(0.09)
Five-pressure vignettes	1.35	(0.10)
Six-pressure vignettes	1.39	(0.13)

The extent to which the actual behavior of the teachers surveyed might reflect these self-reported intentions is debatable. Even our self-reports do not all claim ready compliance with external factors. For example, one elementary school teacher interviewed in early 1979 spoke as follows of a management system (with its objectives and tests) actively promoted by her district administration:[11]

> I tend to take what I need from the system and ignore what I don't need or I tend to--you know--just be quiet about it and no one bothers you.

Later (s)he added:

> You put me on the spot when you talk about [the management system] because I just kind of ignore it. So I'm not supposed to ignore it. I'm supposed to know what it's all about and I do in terms of record keeping, but I don't in terms of real, deep mechanics of it.

Regardless of whether such noncompliance is widespread, it is interesting to note that teachers' expressed willingness to change was very high in our first policy-capturing sample.

Regardless of how our studies of actual behavior turn out, it is interesting to note that teachers' expressed willingness to change in our first sample was very high.

We have considered doing other policy-capturing studies. For example, one variation of the above study might deal with competing

[11] This teacher is not one of the seven teachers participating in our 1979-80 case studies (described below).

pressures, that is, pressures that call for different content. We might also be able to take into account different external factors and differences in the information the teacher is provided about these factors (e.g., who the advocates of a certain content message are, what characteristics they have which might lead to attributions of authority or power). Other policy-capturing studies might ask teachers to select textbooks or tests on the basis of systematically varied information about these materials and their advocates. One aim of such studies would be to see to what extent teachers might be swayed by the endorsement of persons portrayed as knowledgeable or powerful and to what extent they would rely solely on information presented without such endorsements.

Inducements for Change

One of our purposes in this paper is to advance our model of content decision making beyond this first policy-capturing study in which the six external factors were taken in isolation from their context in the organization of schooling. We want to develop a more comprehensive explanation for why content is changed.

We focus on external factors that have a content message. There are other ways in which the content of instruction might be influenced, such as the constraints imposed by availability of resources, spatial arrangements within a school, and teachers' favored instructional strategies. But to keep our model simple, at least at the beginning, we propose to consider such constraints in the weighting of benefits and costs of a particular content message, as discussed below.

In short, our interest is in teachers faced with a message that suggests a change in content. For example, we might consider teachers who are the veterans within a particular school and who are asked to change what they are doing. Or we might take newcomers to the

school who are confronted with a new set of demands that imply changes in what they previously did or were intending to do.

We would have three main questions as the basis for our model:

1. How compatible does the teacher perceive the message to be with his/her conception of what and why mathematics ought to be taught in elementary school?

2. How much obligation does the teacher feel toward the transmitter of the message, regardless of its content and any anticipated benefits?[12]

3. What extrinsic benefits and costs does the teacher perceive to be contingent upon compliance with the message?

Compatibility with teacher's conception. The conception that a teacher has of what ought to be taught in elementary school mathematics may have an important influence on the content covered. Teachers who feel strongly that certain topics should be covered are more likely to teach these topics. They are also more likely to accept proposed changes that would increase the attention given to these topics and to resist changes that would decrease that attention.

The teacher's conception potentially relates to external factors and content covered in two ways: (1) as a variable which interacts with external factors in affecting content covered, and (2) as a mediating variable between external factors and content covered.

In the first case, a teacher's conception itself would not be expected to change as a result of the influence of external factors, but it would increase or decrease the effect of the external factors. That is,

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[12] Questions 2 and 3 and their elaboration are inspired primarily by our reading of Spady and Mitchell (1979, Note 1, Note 8, Note 9) and their reformulation of Max Weber's modes of authority. Our own interpretation of this work is also influenced by Bell (1975), Blau (1964), and Dornbusch and Scott (1975).

if a teacher's conception is compatible with the external factors (e.g., in emphasizing computational skills), then the external factors might well have a greater effect on content covered than if the teacher's conception were not compatible.

In the second case, an external factor might, over time, change the teacher's conception of mathematics, with this changed conception in turn affecting the content covered. For example, if a teacher who knew little about geometry and used to think it unimportant learns from a course or workshop that geometry is important, this change would make the teacher's conception more compatible with the external factor and might lead to more geometry being covered in class.

At this point in our research we have not determined exactly how the teacher's conception is best characterized and measured. For our purposes it may be enough to know how important a teacher regards the teaching of particular topics. But two teachers may think a topic equally important for different reasons. One teacher may consider a topic important because it is the key to the understanding of other topics. Another teacher may find the topic important because students enjoy the topic and find it motivating. An external factor that would change the first teacher's opinion might not change the second teacher's opinion and vice versa. Therefore, our measures of a teacher's conception may also have to become refined enough to include various dimensions, such as what the teacher knows about various mathematical topics, the value these topics have for students (as perceived by the teacher), the interest that student and teacher have in these topics (again as perceived by the teacher), and the perceived difficulty of the topics.

No matter how the teacher's conception is characterized and measured, we would want to compare demands to change content with this conception.

Teachers are more likely to accept change in content congruent with their conceptions than content divergent from their conceptions.

Obligation. Various circumstances could lead the teacher to give serious consideration to a content message, regardless of its content or anticipated benefits.

One such circumstance occurs when content messages are embodied in social norms. The idea that a certain content ought to be taught at a certain grade level can constitute a social norm. Such a norm may be shared among teachers as well as among the people with whom they deal (administrators, students, and parents). For example, a teacher in one of our interviews talked about such a norm: "I think for some reason--maybe on the sands of time--someone decided that multiplication belonged in the third grade and that is where it is. And woe to he who probably ever would try to move it." Such norms constitute what might be called the traditional content of a school or school district and hence are, we expect, a primary source of resistance to change. The effect of such norms might be investigated through the study of teachers who are new to a district.

Another such circumstance could be created by content messages embodied in organizational rules. An example of these rule messages would be school district adoption of instructional objectives for elementary school mathematics.[13] For some persons, making rules of objectives gives the objectives a weight independent of their content.

Then there are the content messages endorsed by persons considered to be experts. Endorsement by an expert is another way to ensure considera-

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[13]Note, however, that Lortie (1969) says that curriculum guides are often not regarded as rules.

tion of a proposal, regardless of its content or anticipated benefits. Teachers, of course, may vary in the persons they consider to be experts. The range of perceived experts might include mathematicians, professors of mathematics education, curriculum specialists within a school district, or particularly knowledgeable teachers. Thus, the expertise in question might vary from knowledge of mathematics in general to knowledge of mathematics education and what is available in instructional aids and materials.

A fourth circumstance that could lead a teacher to seriously consider a content message occurs when content messages are endorsed by friends or patrons. Sometimes teachers might comply with the advice of such persons solely for reasons of friendship or loyalty.

These four types of obligation are derived from Spady and Mitchell's (Note 1) discussion of authority and its four modes: tradition, legality, expertise, and charisma.[14] The voluntary nature of subordination to authority in Spady and Mitchell (1979, Note 1, Note 8, Note 9) provides for the possibility of inducements to change that cannot be traced to any extrinsic benefits or costs.

Benefits and costs. By adopting a content change, a teacher may attain benefits and incur costs that either add to or subtract from the appeal of the content message itself and the sense of obligation toward whoever or whatever is demanding the change. Primary among the benefits and costs we would consider are the rewards and sanctions that accompany compliance and noncompliance with the proposed change. Each type of

[14]For the purposes of this paper, we take these four types of obligation as given and do not attempt to account for the way they develop, whether through seeking a personal sense of fulfillment as suggested by Spady and Mitchell (Note 1) or in ways suggested by other theorists (e.g., Blau, 1964).

obligation suggests certain rewards or sanctions that might bring increased coercion to the demand for change:

1. Contractual benefits (e.g., extra time for preparation, monetary bonuses) and formal disciplinary actions are characteristic responses to compliance and noncompliance with rules.

2. Social esteem and shaming are the rewards and sanctions associated with social norms. Thus, in the case of content, teaching certain topics might gain respect from other teachers whereas teachers might "talk" or even be shocked if one of their colleagues did not teach topics considered part of the traditional curriculum.

3. Following or rejecting the advice of experts may increase or decrease one's reputation for competence.

4. Warmer relations may be the result of following the advice of friends, while rejecting this advice may weaken ties.

Rewards such as social approval and money are not only characteristic of certain types of obligation, but are applicable in a wide variety of other circumstances.

In addition to rewards and punishments, we must consider costs which, though not susceptible to manipulation by persons in control of the content message, nevertheless weigh in the teacher's decisions about what to teach. For example, does the proposed content require instructional materials that are not available? Does it require more preparation time from the teacher? Does it necessitate dropping other topics that the teacher values? A teacher in one of our interviews mentioned a constraint of this sort. She had not taught measurement to her third-grade students one year because she was accustomed to teaching measurement in resource centers and she considered that year's class too immature to be able to work at these centers.

Questions for investigation. The considerations discussed above can be used to generate various questions and predictions for future investigation:

1. To what extent do the variables enumerated above represent all attempts to change content? In the case studies of content and its determinants (described below), we would try to find instances of content decision making that would *not* be well characterized by the variables we have suggested.

2. To what extent do these inducements account for the influence or lack of influence of textbooks and tests? One of our long-standing aims has been to understand the influence that tests and textbooks exercise on the content of instruction. The above discussion suggests three possibilities:

   a. The teacher covers textbook topics that represent his/her response to other external factors in terms of obligation, benefits and costs, and compatibility with the teacher's own conception of mathematics.

   b. The teacher sees the textbook itself as a compilation of rules, norms, or expert advice.

   c. The teacher follows the textbook topics in the absence of direction from his/her own conception and external factors other than textbooks, but without feeling the sense of obligation implied by point 2b.

3. In reading the following set of predictions, the reader will find it helpful to refer to Table 1. This table cross-classifies the three variables *compatibility, obligation,* and *benefits-costs.* For each of the resulting cells, a rough prediction has been made of the effect of these inducements in terms of likelihood of change in content covered. Although the result shows a clear

pattern across cells, each cell was considered individually in making this prediction. Once the expected effect was designated in words (possible change, change likely, and so on), the words were converted to numerical values (-3 to +3) to facilitate thinking about possible main effects and interactions. In the absence of a better rationale for assigning these values, equal intervals were assumed between each value for likelihood of change.

Given the information in Table 1, we would predict the following effects:

a. The difference between benefits and costs will have an effect on content covered regardless of the teacher's sense of obligation and compatibility between message and conception (main effect for benefits-costs). If the benefits and costs consist of manipulated rewards and sanctions, this effect might be called a power effect (in Spady and Mitchell's terms).

b. Likewise, obligation will have an effect across all categories of compatibility and benefits-costs (main effect for obligation). This effect might be called an authority effect (in Spady and Mitchell's terms).

c. There will be another main effect for compatibility.

d. The effect for benefits-costs will be larger than the effect for compatibility, which in turn will be larger than the effect for obligation.

e. There will be no interactions.

Table 1

Expected Effects; Inducements On Content Covered

	Compatibility of Content Message With Teacher's Conception			
	Low		High	
	Low obligation	High obligation	Low obligation	High obligation
Benefits minus costs positive	Possible change*	Change likely	Change very likely	Certain change
	0	+1	+2	+3
Benefits minus costs negative	No change	Change very unlikely	Change unlikely	Possible change
	-3	-2	-1	0

*Statements within cells represent the predicted effects of inducements on content covered. For purposes of thinking about main effects and interactions, these statements have been converted to numerical values as follows: certain change +3, change very likely +2, change likely +1
possible change 0, change unlikely -1, change very unlikely -2, no change -3

4. Turning to the different types of obligation, we could ask:

   a. If extrinsic benefits are held constant, is any type of obligation more effective than another in bringing about compliance in terms of content covered?

   b. If extrinsic benefits are held constant, to what extent are the various types of obligation cumulative, reinforcing one another's effects when they occur together?

   c. To what extent does the effect of a particular type of obligation vary across teachers?

We do not know whether appropriate data can be collected to test systematically the various hypotheses listed above. The functions of these hypotheses at this point are instead to help guide the data collection in the case studies described below, and to suggest what data might be desirable in the future.

Relationships That Turn Symmetrical

The foregoing discussion assumes a certain subordination on the part of the teacher. Certain relationships, such as that between parent and teacher, are likely to vary from this pattern. The relationship of parents to public school teachers is not preordained. It can vary from subordination to dominance. Parents dominated by teachers are of little interest to us; they are unlikely to influence the content of instruction. But, even after they are excluded, the relationship between parents and teachers can take on all the forms of control discussed by Spady and Mitchell (Note 1): persuasion, authority, power, and exchange.

Probably the most likely interaction is one of persuasion. The parent appeals to the teacher to change content. If the parent lacks a

basis for exercising authority or power, the teacher must be convinced on the basis of the proposal alone. The teacher is free to respond in terms of his/her conception of mathematics and in terms of benefits and costs which have not been manipulated by the parents.

Other parental attempts at control may differ. Parents may threaten to manipulate the costs and benefits accruing to the teacher by going to the principal or school board and getting them to take action if the teacher does not comply--a power play in Spady's terms. Another parent might try exchange, promising to be an aide in return for more emphasis on computational skills. And occasionally or even frequently in some communities, parents may succeed in being seen as expert authorities by teachers. For example, in our university-town interviews, a number of teachers talked of having children ask their mathematically expert parents for answers their teachers did not know.

Similarly, the teacher's relations with the principal may not take a hierarchical form. Lortie (1969) said that teachers want help, not direction from their principal. Initiation should come from the teacher. The principal should not offer unsolicited advice. The Rand change agent study claims that the principal's unique contribution to the implementation of new programs is not in offering how-to-do-it advice, but in giving moral support to teachers and in creating a climate that gives the program legitimacy (Berman & McLaughlin, 1978).

Lortie (1975) painted a picture of teachers who are largely independent in their spheres of influence and who enter into exchange relationships with their principals. The principal does favors for the teacher and the teacher reciprocates. Thus, the principal's influence at any particular time depends upon the balance of transactions in his/her favor. A principal with a positive balance could use this advantage, if he or she

desired, in an attempt to influence content. But such an exhaustible resource is not used lightly, and the principal in this situation might well refrain from making demands if he or she did not consider content a major concern. In contrast, if a principal were acknowledged bt teachers to have the right to make binding content rules--an inexhaustible right, then the principal would have greater opportunities to change content.

Case Studies of Content and its Determinants in Selected Classrooms

During the 1979-80 school year we have been conducting a pilot study of content determination in a small number of classrooms. This study allows us to address a number of problems discussed earlier in this paper. Specifically, the project includes (1) a methodological study of the best way to record the content of instruction, (2) a measurement study operationalizing teachers' conceptions of mathematics, (3) a comparison of the content of instruction with the implied content of textbooks, tests, and objectives, (4) analysis of the reasons for choice of textbooks and tests and choices within textbooks, (5) exploration of the teacher's perception of and response to content messages from outside the classroom, and (6) investigation of the organizational and interpersonal network through which content messages are transmitted to the teacher. In short, this project provides the variety of research tasks needed to advance our program along several disciplinary lines.

Sample Selection

For this study, in keeping with our previous focus on mathematics instruction in fourth grade, we chose five fourth-grade teachers plus one third-grade teacher and one fifth-grade teacher. We also limited ourselves to teachers who were not too extreme in years of teaching experience and not too near retirement age (see overall requirements in Figure 1).

The purpose of the latter restrictions was to increase the chances that the teachers selected would actively consider content changes and would not just struggle to survive the first years of teaching or maintain content chosen long ago.

In addition, we designed our sample to provide variation in factors likely to influence content decisions. The results are summarized in Figure 1. The variables taken into account were chosen for the following reasons:

Urban versus small-town districts. Our choice of districts was constrained by the range of districts within reasonable driving distance. We chose two small-town districts with similar community contexts and one urban district. This choice will allow us to examine the effects of district centralization versus decentralization with less confounding due to other district differences. We expect the urban schools to differ from the small-town schools in many respects (e.g., administrative complexity and bureaucratization, heterogeneity of students and parents, important of mass media, nature of community political structure and processes).

Centralized versus decentralized curriculum. District tests, objectives, and mandated texts suggest district attempts to centralize curriculum decision making. A highly centralized district might distribute objectives to be met, provide a text for meeting these objectives, and test all students to evaluate success with the objectives. A decentralized district would allow teachers to select their own objectives, texts, and tests. A centralized district thus represents an attempt to reinforce hierarchical control over teachers. Centralization is a popular way to try to change the content covered in classrooms. Popularity, however,

as should be clear from earlier parts of this paper, is not necessarily synonymous with effectiveness.

The districts we selected are centralized to a varying degree. We selected (1) an urban district with centralized objectives and testing, but without district-wide selection of textbooks; (2) a small-town district with a mandated mathematics textbook and a district-wide testing program, but without accountability in terms of district objectives; and (3) a small-town district with teacher selected texts, very general district objectives and a district-wide testing program of recent origin.

Teacher isolation. The effects of other teachers on content decisions may be much greater in schools in which classroom isolation is reduced by team teaching, open space architecture, and classroom use of instructional aides. Lortie's (1975) description of the isolated teacher still applies to many school settings, but isolation is not so prevalent as he suggests. The work of Elizabeth Cohen has led us to give special attention to this cluster of variables. "The developing complexity of the [instructional] technology," she writes, "pushes the traditional simple organizational structure with its pattern of isolated teachers into new staffing patterns of teacher collaboration, the use of teacher aides and community volunteers, as well as the introduction of reading specialists" (Cohen, Note 10; see also Cohen, Meyer, Scott, & Deal, 1979). Within each of the three school districts we were able to locate one school building in which teachers were isolated and one building in which teacher isolation was reduced. For our final sample, one teacher was selected from each of these buildings. In addition, we selected a second teacher in one of the buildings to get a tentative sense for the different ways in which teachers respond to the same school setting.

Membership on district curriculum committee. This variable ensures that two of the teachers in our study have direct access to information

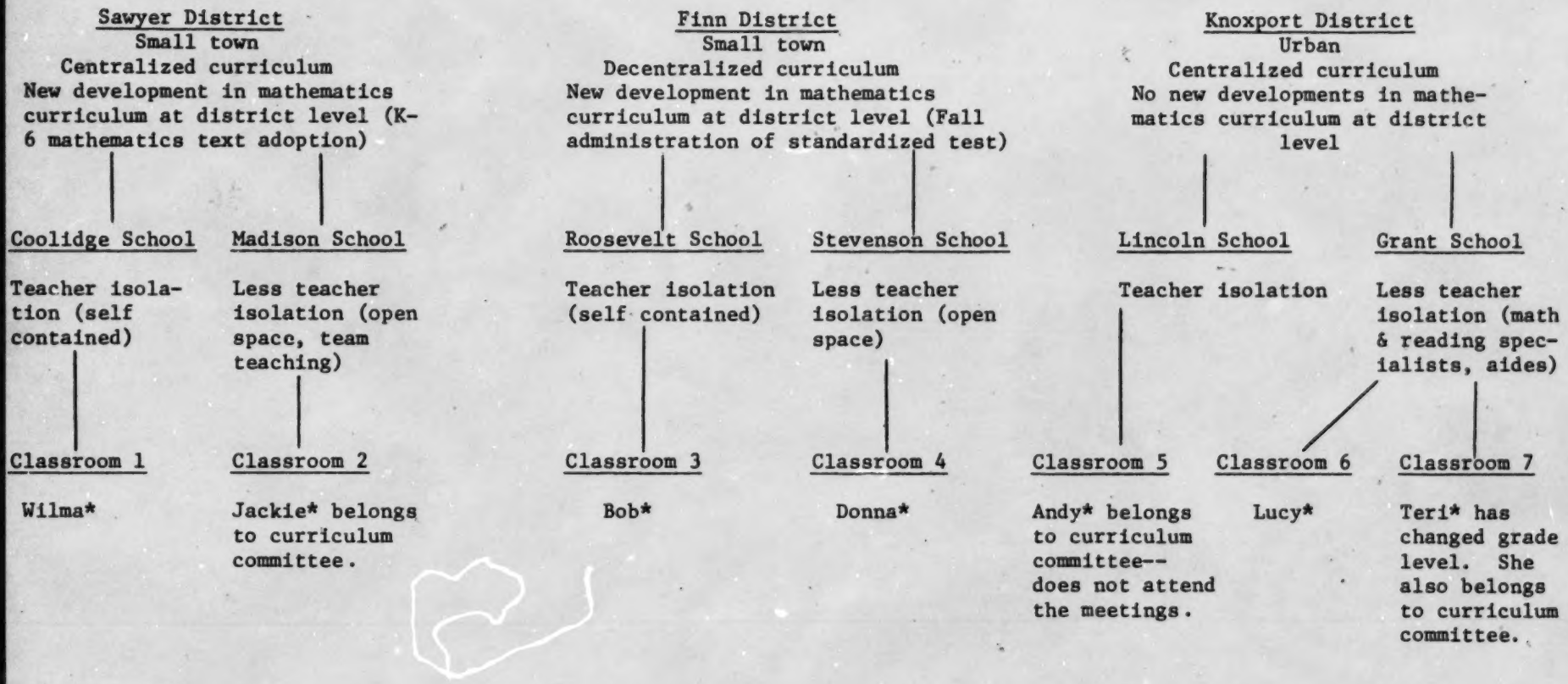
on what curriculum changes are being proposed or adopted at the district level.

Teacher change of assignment. Newly assigned teachers are placed in a position of vulnerability to change by being taken away from the setting in which they might have had a set routine. They are thereby exposed to expectations which may differ from the ones in their former assignments. To be able to study this situation, we found a teacher who had changed grade level this year.

Caveat. The preceding variables were chosen not because they exhaust the factors we consider important. Rather, by selecting a sample on the basis just described, we can ensure contrasts that will be useful in exploring the importance of both these and other variables.

Data Collection

Our data collection includes lengthy initial and end-of-year interviews with each teacher, daily teacher logs of content coverage, brief weekly interviews with each teacher, daily teacher logs of content coverage, brief weekly interviews with each teacher, attendance at special meetings in the school building and district, interviews with individuals who influence curriculum decisions (e.g., curriculum directors, principals), and limited classroom observations. These activities give us the opportunity to monitor in detail the content covered by each teacher during the year, and to explore explanations for this choice of content, including the sociologically-oriented explanations discussed earlier in this paper.



*Each teacher meets the following overall requirements: teaches grades 3, 4, or 5; at least 2 years, but no more than 25 years experience; under 60 years of age.

The names of districts, schools, and teachers in this chart are fictitious.

Figure 1. Sample for case studies of content and its determinants.

Drawing Together, Toward a Conclusion

The program of research described above is an eclectic one. Help is needed from diverse disciplines toward defining and measuring content, external factors, and teachers' conceptions of mathematics. We view our research as an effort to bring together three lines of inquiry heretofore largely separate:

1. Research on teacher decision making (Shavelson, 1976; Shulman and Elstein, 1975). To measure the content of classroom instruction, we need to know the work of school learning psychologists.

2. Research on the educational implications of subject-matter specialties (such as mathematics). To develop our taxonomy, we need to be familiar with certain aspects of mathematics education.

3. Research on school governance and related political and sociological processes. Here we need to draw on literature from the politics of education (Schwille, Porter, & Gant, Note 6) and the sociology of education.

Such an agenda calls on psychologists and sociologists to go beyond the mutual criticism to which they are accustomed and to collaborate in building a model of content decision making. Our on-going literature review, of which this paper is a part, is meant to bring us nearer this goal. We welcome criticisms and suggestions that would advance this undertaking.

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